



PTO/SB/08a (08-03)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1

of 12

**Complete if Known**

Application Number 10/686,828

Filing Date Oct. 15, 2003

First Named Inventor Eric S. Olson

Art Unit

Examiner Name

Attorney Docket Number TCOM-0010

**U. S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Document Number                          | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|--------------------|-----------------------|--|--------------------------------|--|---|
|                    |                       | Number-Kind Code <sup>2</sup> (if known) |                                |  |   |
| ISA<br>↓<br>ISA    |                       | US-4088955                               | 05-09-1978                     | Baghdady   |   |
|                    |                       | US-4309769                               | 01-05-1982                     | Taylor, Jr.  |   |
|                    |                       | US-4359738                               | 11-16-1982                     | Lewis  |   |
|                    |                       | US-4665401                               | 05-12-1987                     | Garrard et al.                                     |   |
|                    |                       | US-4670885                               | 06-02-1987                     | Pari et al.  |   |
|                    |                       | US-4780885                               | 10-25-1988                     | Paul et al.  |   |
|                    |                       | US-4856025                               | 10-08-1989                     | Takai  |   |
|                    |                       | US-4893316                               | 01-09-1990                     | Janc et al.  |   |
|                    |                       | US-4922506                               | 05-01-1990                     | McCallister et al.                                 |   |
|                    |                       | US-4933639                               | 06-12-1990                     | Barker   |   |
|                    |                       | US-4965732                               | 10-23-1990                     | Roy III et al.                                     |   |
|                    |                       | US-5017929                               | 05-21-1991                     | Tsuda  |   |
|                    |                       | US-5099493                               | 05-24-1992                     | Zeger et al.                                       |   |
|                    |                       | US-5105435                               | 04-14-1992                     | Stilwell   |   |
|                    |                       | US-5109390                               | 04-28-1992                     | Gilhausen et al.                                   |   |
|                    |                       | US-5119401                               | 06-02-1992                     | Tsujimoto  |   |
|                    |                       | US-5136296                               | 04-04-1992                     | Roettger et al.                                    |   |
|                    |                       | US-5151919                               | 09-29-1992                     | Dent   |   |

**FOREIGN PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Foreign Patent Document   | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or<br>Relevant Figures Appear | T <sup>6</sup> |
|--------------------|-----------------------|---|--------------------------------|--|---|----------------|
|                    |                       | Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known) |                                |  |   |                |
| ISA                |                       | EP 0558910 A1   | 01-25-1993                     | Blaupunkt-Werke GmbH                               |   | 435073         |
| ISA                |                       | EP 0610989 A2   | 01-31-1994                     | Philips Patentverwaltung GmbH                      |   | 435073         |
| ISA                |                       | JP2000-13360A   | 01-14-2000                     | NEC Corp.  |   | 435073         |
| ISA                |                       | DE 4201439 A1   | 07-22-1993                     | Daimler-Benz                                       |   | 435073         |
| ISA                |                       | DE 4326843 A1   | 02-16-1995                     | Richard Hirschmann GmbH & Co                       |   | 435073         |

Examiner  
Signature

/Sam Ahn/

Date  
Considered

03/15/2007

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 2

of 12

**Complete if Known**

Application Number 10/686,828

Filing Date Oct. 15, 2003

First Named Inventor Eric S. Olson

Art Unit

Examiner Name

Attorney Docket Number TCOM-0010

**U. S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Document Number<br>Number-Kind Code <sup>2</sup> (if known) | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|--------------------|-----------------------|---|--------------------------------|--|---|
| /SA/               |                       | US- 5218359   | 06-08-1993                     | Minamisono   |   |
|                    |                       | US- 5218619   | 06-08-1993                     | Dent   |   |
|                    |                       | US- 5220687   | 06-05-1993                     | Ichikawa et al.                                    |   |
|                    |                       | US- 5224122   | 06-29-1993                     | Bruckert   |   |
|                    |                       | US- 5237586   | 08-17-1993                     | Bottomley  |   |
|                    |                       | US- 5263191   | 11-16-1993                     | Dickerson  |   |
|                    |                       | US- 5280472   | 01-18-1994                     | Gilhousen et al.                                   |   |
|                    |                       | US- 5305349   | 04-19-1994                     | Dent   |   |
|                    |                       | US- 5325394   | 06-28-1994                     | Bruckert   |   |
|                    |                       | US- 5343493   | 08-30-1994                     | Karimullah   |   |
|                    |                       | US- 5343496   | 08-30-1994                     | Honig et al.                                       |   |
|                    |                       | US- 5347535   | 09-13-1994                     | Karasawa et al.                                    |   |
|                    |                       | US- 5353302   | 10-04-1994                     | Bi   |   |
|                    |                       | US- 5386202   | 01-31-1995                     | Cochran et al.                                     |   |
|                    |                       | US- 5390207   | 02-14-1995                     | Fenton et al.                                      |   |
|                    |                       | US- 5394110   | 02-28-1995                     | Mizoguchi  |   |
|                    |                       | US- 5396256   | 03-07-1995                     | Chiba et al.                                       |   |
| /SA/               |                       | US-5437055  | 07-25-1995                     | Wheatley III                                       |   |

**FOREIGN PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Foreign Patent Document<br>Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known) | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant Passages<br>or Relevant Figures Appear | T <sup>6</sup> |
|--------------------|-----------------------|--|--------------------------------|--|---|----------------|
| /SA/               |                       | DE 4343959 A1  | 06-29-1995                     | Richard Hirschmann GmbH & Co                       |   | 522068         |
| /SA/               |                       | WO 93/12590  | 06-24-1995                     | Array-Comm, Inc.                                   |   | 522086         |
| /SA/               |                       | GB 2280575 A   | 02-01-1995                     | Roke Manor Research Limited                        |   | 522064         |
|                    |                       |  |                                |  |   | 522064         |
|                    |                       |  |                                |  |   | 522064         |

Examiner  
Signature

/Sam Ahn/

Date  
Considered

03/15/2007

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 3 of 12

**Complete if Known**

|                        |               |
|------------------------|---------------|
| Application Number     | 10/686,828    |
| Filing Date            | Oct. 15, 2003 |
| First Named Inventor   | Eric S. Olson |
| Art Unit               |               |
| Examiner Name          |               |
| Attorney Docket Number | TCOM-0010     |

**U. S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Document Number                          | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|--------------------|-----------------------|--|--------------------------------|--|---|
|                    |                       | Number-Kind Code <sup>2</sup> (if known) |                                |  |   |
| /SA/               |                       | US- 5440265                              | 08-08-1995                     | Cochran et al.                                     |   |
|                    |                       | US- 5448600                              | 09-05-1995                     | Lucas  |   |
|                    |                       | US- 5481570                              | 01-02-1996                     | Winters  |   |
|                    |                       | US- 5506865                              | 04-09-1996                     | Weaver Jr.   |   |
|                    |                       | US- 5513176                              | 04-30-1996                     | Dean et al.  |   |
|                    |                       | US- 5533011                              | 04-02-1996                     | Dean et al.  |   |
|                    |                       | US- 5553098                              | 09-03-1996                     | Cochran et al.                                     |   |
|                    |                       | US- 5602833                              | 02-11-1997                     | Zehavi   |   |
|                    |                       | US- 5644592                              | 07-01-1997                     | Divsalar   |   |
|                    |                       | US- 5736964                              | 04-07-1998                     | Ghosh et al.                                       |   |
|                    |                       | US- 5787130                              | 07-28-1998                     | Kotzin et al.                                      |   |
|                    |                       | US- 5844521                              | 12-01-1998                     | Stephens et al.                                    |   |
|                    |                       | US- 5859613                              | 01-12-1999                     | Otto   |   |
|                    |                       | US- 5872540                              | 02-16-1999                     | Casabona   |   |
|                    |                       | US- 5872776                              | 02-16-1999                     | Yang   |   |
|                    |                       | US- 5926761                              | 07-20-1999                     | Reed et al.  |   |
|                    |                       | US- 5930229                              | 07-27-1999                     | Yoshida et al.                                     |   |
| /SA/               |                       | US-5953369                               | 09-14-1999                     | Suzuki   |   |

**FOREIGN PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Foreign Patent Document   | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant Passages<br>or Relevant Figures Appear | T <sup>6</sup> |
|--------------------|-----------------------|---|--------------------------------|--|---|----------------|
|                    |                       | Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known) |                                |  |   |                |
|                    |                       |   |                                |  |   | 548157         |
|                    |                       |   |                                |  |   | 548157         |
|                    |                       |   |                                |  |   | 548157         |
|                    |                       |   |                                |  |   | 548157         |
|                    |                       |   |                                |  |   | 548157         |

Examiner  
Signature

/Sam Ahn/

Date  
Considered

03/15/2007

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 4

of 12

**Complete if Known**

|                        |               |
|------------------------|---------------|
| Application Number     | 10/686,828    |
| Filing Date            | Oct. 15, 2003 |
| First Named Inventor   | Eric S. Olson |
| Art Unit               |               |
| Examiner Name          |               |
| Attorney Docket Number | TCOM-0010     |

**U. S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Document Number<br>Number-Kind Code <sup>2</sup> (if known) | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|--------------------|-----------------------|---|--------------------------------|--|---|
| ISA<br>↓<br>ISA    |                       | US- 5995499   | 11-30-1999                     | Hottinen et al.                                    |   |
|                    |                       | US- 6002727   | 12-14-1999                     | Uesugi   |   |
|                    |                       | US- 6014373   | 01-11-2000                     | Schilling et al.                                   |   |
|                    |                       | US- 6018317   | 01-25-2000                     | Dogan et al.                                       |   |
|                    |                       | US- 6088383   | 07-11-2000                     | Suzuki et al.                                      |   |
|                    |                       | US- 6101385   | 08-08-2000                     | Monte et al.                                       |   |
|                    |                       | US- 6104712   | 08-15-2000                     | Robert et al.                                      |   |
|                    |                       | US- 6115409   | 09-05-2000                     | Upadhyay et al.                                    |   |
|                    |                       | US- 6127973   | 10-03-2000                     | Choi et al.  |   |
|                    |                       | US- 6131013   | 10-10-2000                     | Bergstrom et al.                                   |   |
|                    |                       | US- 6137788   | 10-24-2000                     | Sawahashi et al.                                   |   |
|                    |                       | US- 6141332   | 10-31-2000                     | Lavaen   |   |
|                    |                       | US- 6154443   | 11-28-2000                     | Huang et al.                                       |   |
|                    |                       | US- 6157685   | 12-05-2000                     | Tanaka et al.                                      |   |
|                    |                       | US- 6157842   | 12-05-2000                     | Kaisson et al.                                     |   |
|                    |                       | US- 6157847   | 12-05-2000                     | Buehrer et al.                                     |   |
|                    |                       | US- 6163696   | 12-19-2000                     | Bi et al.  |   |
|                    |                       | US- 6166690   | 12-26-2000                     | Lin et al.   |   |

**FOREIGN PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Foreign Patent Document<br>Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known) | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant Passages<br>or Relevant Figures Appear | T <sup>6</sup> |
|--------------------|-----------------------|--|--------------------------------|--|---|----------------|
|                    |                       |  |                                |  |   | 801437         |
|                    |                       |  |                                |  |   | 801437         |
|                    |                       |  |                                |  |   | 601437         |
|                    |                       |  |                                |  |   | 601437         |
|                    |                       |  |                                |  |   | 801437         |

Examiner  
Signature

/Sam Ahn/

Date  
Considered

03/15/2007

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 5

of 12

**Complete if Known**

Application Number 10/686,828

Filing Date Oct. 15, 2003

First Named Inventor Eric S. Olson

Art Unit

Examiner Name

Attorney Docket Number TCOM-0010

**U. S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Document Number                          | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|--------------------|-----------------------|--|--------------------------------|--|---|
|                    |                       | Number-Kind Code <sup>2</sup> (if known) |                                |  |   |
| /SA/               |                       | US- 6172969                              | 01-09-2001                     | Kawakami et al.                                    |   |
|                    |                       | US- 6175587                              | 01-15-2001                     | Madhow et al.                                      |   |
|                    |                       | US- 6192067                              | 02-20-2001                     | Toda et al.  |   |
|                    |                       | US- 6201799                              | 03-13-2001                     | Huang et al.                                       |   |
|                    |                       | US- 6215812                              | 04-10-2001                     | Young et al.                                       |   |
|                    |                       | US- 6219376                              | 04-17-2001                     | Zhodzishsky et al.                                 |   |
|                    |                       | US- 6222828                              | 04-24-2001                     | Ohlson et al.                                      |   |
|                    |                       | US- 6230180                              | 05-08-2001                     | Mohamed  |   |
|                    |                       | US- 6233229                              | 05-15-2001                     | Ranta et al.                                       |   |
|                    |                       | US- 6233459                              | 05-15-2001                     | Sullivan et al.                                    |   |
|                    |                       | US- 6240124                              | 05-29-2001                     | Wiedeman et al.                                    |   |
|                    |                       | US- 6252535                              | 06-26-2001                     | Kober et al.                                       |   |
|                    |                       | US- 6256336                              | 07-03-2001                     | Rademacher et al.                                  |   |
|                    |                       | US- 6259688                              | 07-10-2001                     | Schilling et al.                                   |   |
|                    |                       | US- 6263208                              | 07-17-2001                     | Chang et al.                                       |   |
|                    |                       | US- 6275186                              | 08-14-2001                     | Kong   |   |
| /SA/               |                       | US- 6278726                              | 08-21-2001                     | Mesecher et al.                                    |   |
|                    |                       | US- 6282231                              | 08-21-2001                     | Norman et al.                                      |   |

**FOREIGN PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Foreign Patent Document   | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant Passages<br>or Relevant Figures Appear | T <sup>6</sup> |
|--------------------|-----------------------|---|--------------------------------|--|---|----------------|
|                    |                       | Country Code <sup>3</sup> , Number <sup>4</sup> , Kind Code <sup>5</sup> (if known) |                                |  |   |                |
|                    |                       |   |                                |  |   | 619206         |
|                    |                       |   |                                |  |   | 619206         |
|                    |                       |   |                                |  |   | 619206         |
|                    |                       |   |                                |  |   | 619206         |
|                    |                       |   |                                |  |   | 619206         |

Examiner  
Signature

/Sam Ahn/

Date  
Considered

03/15/2007

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 6

of 12

**Complete if Known**

|                        |               |
|------------------------|---------------|
| Application Number     | 10/686,828    |
| Filing Date            | Oct. 15, 2003 |
| First Named Inventor   | Eric S. Olson |
| Art Unit               |               |
| Examiner Name          |               |
| Attorney Docket Number | TCOM-0010     |

**U. S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Document Number<br>Number-Kind Code <sup>2</sup> (if known) | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|--------------------|-----------------------|---|--------------------------------|--|---|
| /SA/               |                       | US- 6282233   | 08-28-2001                     | Yoshida  |   |
|                    |                       | US- 6285316   | 09-04-2001                     | Nir et al.   |   |
|                    |                       | US- 6285319   | 09-04-2001                     | Rose   |   |
|                    |                       | US- 6301289   | 10-09-2001                     | Bejjani et al.                                     |   |
|                    |                       | US- 6304618   | 10-16-2001                     | Hafeez et al.                                      |   |
|                    |                       | US- 6308072   | 10-23-2001                     | Labedz et al.                                      |   |
|                    |                       | US- 6310704   | 10-30-2001                     | Dogan et al.                                       |   |
|                    |                       | US- 6317453   | 11-13-2001                     | Chang  |   |
|                    |                       | US- 6321090   | 11-20-2001                     | Soliman  |   |
|                    |                       | US- 6324159   | 11-27-2001                     | Mennekens et al.                                   |   |
|                    |                       | US- 6327471   | 12-04-2001                     | Song   |   |
|                    |                       | US- 6330460   | 12-11-2001                     | Wong et al.  |   |
|                    |                       | US- 6333947   | 12-25-2005                     | van Heeswyk et al.                                 |   |
|                    |                       | US- 6351235   | 02-26-2002                     | Stilp  |   |
|                    |                       | US- 6351642   | 02-26-2002                     | Corbett et al.                                     |   |
|                    |                       | US- 6359874   | 03-19-2002                     | Dent   |   |
|                    |                       | US- 6362760   | 03-26-2002                     | Kober et al.                                       |   |
| /SA/               |                       | US-6377636  | 04-23-2002                     | Paulraj et al.                                     |   |

**FOREIGN PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Foreign Patent Document<br>Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known) | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant Passages<br>or Relevant Figures Appear | T <sup>6</sup> |
|--------------------|-----------------------|--|--------------------------------|--|---|----------------|
|                    |                       |  |                                |  |   | 628531         |
|                    |                       |  |                                |  |   | 628531         |
|                    |                       |  |                                |  |   | 628531         |
|                    |                       |  |                                |  |   | 628531         |
|                    |                       |  |                                |  |   | 628531         |

Examiner  
Signature

/Sam Ahn/

Date  
Considered

03/15/2007

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 7

of 12

**Complete if Known**

|                        |               |
|------------------------|---------------|
| Application Number     | 10/686,828    |
| Filing Date            | Oct. 15, 2003 |
| First Named Inventor   | Eric S. Olson |
| Art Unit               |               |
| Examiner Name          |               |
| Attorney Docket Number | TCOM-0010     |

**U. S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Document Number                          | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|--------------------|-----------------------|--|--------------------------------|--|---|
|                    |                       | Number-Kind Code <sup>2</sup> (if known) |                                |  |   |
| /SA/               |                       | US- 6380879                              | 04-30-2002                     | Kober et al.                                       |   |
|                    |                       | US- 6396804                              | 05-28-2002                     | Odenwalder   |   |
|                    |                       | US- 6430216                              | 08-06-2002                     | Kober et al.                                       |   |
|                    |                       | US- 6459693                              | 10-01-2002                     | Park et al.  |   |
|                    |                       | US- 20010003443                          | 06-14-2001                     | Velazquez et al.                                   |   |
|                    |                       | US- 20010020912                          | 09-13-2001                     | Naruse et al.                                      |   |
|                    |                       | US- 20010021646                          | 09-13-2001                     | Antonucci et al.                                   |   |
|                    |                       | US- 20010046266                          | 11-29-2001                     | Rakib et al.                                       |   |
|                    |                       | US- 20020001299                          | 01-23-2002                     | Petch et al.                                       |   |
|                    |                       | US- 20020172173                          | 11-21-2002                     | Schilling et al.                                   |   |
|                    |                       | US- 20030053526                          | 03-20-2003                     | Reznik   |   |
|                    |                       | US- 6285861                              | 09-04-2001                     | Bonaccorso et al.                                  |   |
|                    |                       | US- 3742201                              | 06-26-1973                     | Groginsky  |   |
|                    |                       | US- 4713794                              | 12-15-1987                     | Byington et al.                                    |   |
|                    |                       | US- 5377183                              | 12-27-1994                     | Dent   |   |
|                    |                       | US- 20020051433                          | 05-02-2002                     | Affes et al.                                       |   |
|                    |                       | US- 5894500                              | 04-13-1999                     | Bruckert et al.                                    |   |
| /SA/               |                       | US- 6404760                              | 06-11-2002                     | Holtzman et al.                                    |   |

**FOREIGN PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Foreign Patent Document  | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant Passages<br>or Relevant Figures Appear | T <sup>6</sup> |
|--------------------|-----------------------|--|--------------------------------|--|---|----------------|
|                    |                       | Country Code <sup>3</sup> Number * Kind Code <sup>5</sup> (if known) |                                |  |   |                |
|                    |                       |  |                                |  |   | 643021         |
|                    |                       |  |                                |  |   | 643021         |
|                    |                       |  |                                |  |   | 643021         |
|                    |                       |  |                                |  |   | 643021         |
|                    |                       |  |                                |  |   | 643021         |

Examiner  
Signature

/Sam Ahn/

Date  
Considered

03/15/2007

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 8

of 12

**Complete if Known**

Application Number 10/686,828

Filing Date Oct. 15, 2003

First Named Inventor Eric S. Olson

Art Unit

Examiner Name

Attorney Docket Number TCOM-0010

**U. S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Document Number<br>Number-Kind Code <sup>2</sup> (if known) | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|--------------------|-----------------------|---|--------------------------------|--|---|
| /SA/               |                       | US- 6584115   | 06-24-2003                     | Suzuki   |   |
|                    |                       | US- 6266529   | 07-24-2001                     | Chheda   |   |
|                    |                       | US- 5978413   | 11-02-1999                     | Bender   |   |
|                    |                       | US- 6590888   | 07-08-2003                     | Ohshima  |   |
|                    |                       | US- 20020176488   | 11-28-2002                     | Kober et al.                                       |   |
|                    |                       | US- 6032056   | 02-29-2000                     | Reudink  |   |
|                    |                       | US- 4601046   | 07-15-1986                     | Halpern  |   |
|                    |                       | US- 6515980   | 02-04-2003                     | Bottomley  |   |
|                    |                       | US- 6574,270  | 06-03-2003                     | Madkour  |   |
|                    |                       | US- 6798737   | 09-28-2004                     | Dabak  |   |
|                    |                       | US- 6501788   | 12-31-2002                     | Wang   |   |
|                    |                       | US- 6801565   | 10-05-2004                     | Bottomley  |   |
|                    |                       | US- 6404760   | 06-11-2002                     | Holtzman   |   |
|                    |                       | US- 6385264   | 05-07-2002                     | Terasawa   |   |
|                    |                       | US- 6680727   | 01-20-2004                     | Butler   |   |
|                    |                       | US- 6570909   | 05-27-2003                     | Kansakoski   |   |
|                    |                       | US- 6580771   | 06-17-2003                     | Kenney   |   |
| /SA/               |                       | US- 6363104   | 03-26-2002                     | Bottomley  |   |

**FOREIGN PATENT DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Foreign Patent Document<br>Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known) | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant Passages<br>or Relevant Figures Appear | T <sup>6</sup> |
|--------------------|-----------------------|--|--------------------------------|--|---|----------------|
|                    |                       |  |                                |  |   | 597841         |
|                    |                       |  |                                |  |   | 597841         |
|                    |                       |  |                                |  |   | 597841         |
|                    |                       |  |                                |  |   | 597841         |
|                    |                       |  |                                |  |   | 597841         |

Examiner  
Signature

/Sam Ahn/

Date  
Considered

03/15/2007

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|   |       |                          |               |
|---|-------|--------------------------|---------------|
| Substitute for form 1449B/PTO   |       | <b>Complete if Known</b> |               |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(Use as many sheets as necessary) |       | Application Number       | 10/686,828    |
|   |       | Filing Date              | Oct. 15, 2003 |
|   |       | First Named Inventor     | Eric S. Olson |
|   |       | Art Unit                 |               |
|   |       | Examiner Name            |               |
| Sheet 9   | of 12 | Attorney Docket Number   | TCOM-0010     |

| NON PATENT LITERATURE DOCUMENTS |                       |   |                |
|---------------------------------|-----------------------|---|----------------|
| Examiner Initials*              | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
| /SA/                            |                       | MITRA, ET AL., Adaptive Decorrelating Detectors for CDMA Systems, Accepted for Wireless Communications Journal, Accepted May 1995   |                |
| ↓                               |                       | SCHNEIDER, Optimum Detection of Code Division Multiplexed Signals, IEEE Transactions on Aerospace and Electronic Systems, Jan. 1979, Vol. AES-15 No. 1  | 12             |
|                                 |                       | MITRA, ET AL., Adaptive Receiver Algorithms for Near-Far Resistant CDMA, IEEE Transactions on Communications, Apr. 1995   |                |
|                                 |                       | LUPAS, ET AL. Near-Far Resistance of Multiuser Detectors in Asynchronous Channels, IEEE Transactions on Communications, April 1990, Vol. 38, No. 4  |                |
|                                 |                       | LUPAS, ET AL., Linear Multiuser Detectors for Synchronous Code-Division Multiple-Access Channels, IEEE Transactions on Information Theory, Jan. 1989, Vol. 35, No. 1  |                |
|                                 |                       | KOHNO, ET AL., Cancellation Techniques of Co-Channel Interference in Asynchronous Spread Spectrum Multiple Access Systems, May 1983, Vol. J 56-A. No. 5   |                |
|                                 |                       | GARG, ET AL., Wireless and Personal Communications Systems, 1996, pgs. 79-151, Prentice Hall, Upper Saddle River, NJ, US  |                |
|                                 |                       | CHENG, ET AL., Spread-Spectrum Code Acquisition in the Presence of Doppler Shift and Data Modulation, IEEE Transactions on Communications, Feb. 1990, Vol. 38, No. 2  |                |
| ↓                               |                       | BEHRENS ET AL., Parameter Estimation in the Presence of Low Rank Noise, pgs. 341-344, Maple Press, 1988   |                |
| /SA/                            |                       | BEST, Phase-Locked Loops - Design, Simulation, and Applications, pgs. 251-287, McGraw-Hill, 1999  |                |

|                    |           |                 |            |
|--------------------|-----------|-----------------|------------|
| Examiner Signature | /Sam Ahn/ | Date Considered | 03/15/2007 |
|--------------------|-----------|-----------------|------------|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|   |                        |                          |               |
|---|------------------------|--------------------------|---------------|
| Substitute for form 1449B/PTO   |                        | <b>Complete if Known</b> |               |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(Use as many sheets as necessary) |                        | Application Number       | 10/686,828    |
|   |                        | Filing Date              | Oct. 15, 2003 |
|   |                        | First Named Inventor     | Eric S. Olson |
|   |                        | Art Unit                 |               |
|   |                        | Examiner Name            |               |
| Sheet 10 of 12  | Attorney Docket Number | TCOM-0010                |               |

| NON PATENT LITERATURE DOCUMENTS |                       |   |                |
|---------------------------------|-----------------------|---|----------------|
| Examiner Initials*              | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
| /SA/                            |                       | ILTIS, Multiuser Detection of Quasisynchronous CDMA Signals Using Linear Decorrelators, IEEE Transactions on Communications, Nov. 1996, Vol. 44, No. 11   |                |
| ↓                               |                       | RAPPAPORT, Wireless Communications - Principles & Practice, 1996, pgs. 518-533, Prentice Hall, Upper Saddle River, NJ, US   | 12             |
|                                 |                       | SCHARF, ET AL., Matched Subspace Detectors, IEEE Transactions on Signal Processing, Aug. 1994, Vol. 42, No. 8.  |                |
|                                 |                       | PRICE ET AL., A Communication Technique for Multipath Channels, Proceedings to the IRE, 1958, Vol. 46, The Institute of Radio Engineers, New York, NY, US   |                |
|                                 |                       | AFFES ET AL., Interference Subspace Rejection: A Framework for Multiuser Detection in Wideband CDMA, IEEE Journal on Selected Areas in Communications, Feb. 2002, Vol. 20, No. 2  |                |
|                                 |                       | SCHLEGEL ET AL., Coded Asynchronous CDMA and Its Efficient Detection, IEEE Transactions on Information Theory, Nov. 1998, Vol. 44, No. 7  |                |
|                                 |                       | XIE ET AL., A family of Suboptimum Detectors for Coherent Multiuser Communications, IEEE Journal on Selected Areas in Communications, May 1990, Vol. 8, No. 4   |                |
|                                 |                       | VITERBI, Very Low Rate Convolutional Codes for Maximum Theoretical Performance of Spread Spectrum Multiple-Access Channels, IEEE Journal on Selected Areas in Communications, May 1990, Vol. 8, No. 4   |                |
| ↓                               |                       | VITERBI, CDMA - Principles of Spread Spectrum Communication, 1995, pgs. 11-75 and 179-233, Addison-Wesley, Reading, MA, US  |                |
| /SA/                            |                       | VERDU, Minimum Probability of Error for Asynchronous Gaussian Multiple-Access Channels, IEEE Transactions on Information Theory, Jan. 1986, Vol. IT-32, No. 1   |                |

|                    |           |                 |            |
|--------------------|-----------|-----------------|------------|
| Examiner Signature | /Sam Ahn/ | Date Considered | 03/15/2007 |
|--------------------|-----------|-----------------|------------|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|   |                        |                          |               |
|---|------------------------|--------------------------|---------------|
| Substitute for form 1449B/PTO   |                        | <b>Complete if Known</b> |               |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(Use as many sheets as necessary) |                        | Application Number       | 10/686,828    |
|   |                        | Filing Date              | Oct. 15, 2003 |
|   |                        | First Named Inventor     | Eric S. Olson |
|   |                        | Art Unit                 |               |
|   |                        | Examiner Name            |               |
| Sheet 11 of 12  | Attorney Docket Number | TCOM-0010                |               |

| NON PATENT LITERATURE DOCUMENTS |                       |   |                |
|---------------------------------|-----------------------|---|----------------|
| Examiner Initials*              | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
| /SA/                            |                       | KAPLAN, Understanding GPS - Principles and Applications, 1996, pgs. 83-236, Artech House, Norwood, MA, US   |                |
|                                 |                       | SCHARF, Statistical Signal Processing - Detection, Estimation, and Time Series Analysis, 1990, pgs. 23-75 and 103-178, Addison-Wesley, Reading, MA, US  | 12             |
|                                 |                       | STIMSON, Introduction to Airborne Radar 2nd edition, 1998, pgs. 163-176 and 473-491, SciTech Publishing, Mendham, NJ, US  |                |
|                                 |                       | BEHRENS ET AL., Signal Processing Applications of Oblique Projection Operators, IEEE Transactions on Signal Processing, Jun. 1994, Vol. 42, No. 6   |                |
|                                 |                       | ALEXANDER ET AL., A Linear Receiver for Coded Multiuser CDMA, IEEE Transactions on Communications, May 1997, Vol. 45, No. 5   |                |
|                                 |                       | SCHLEGEL ET AL., Multiuser Projection Receivers, IEEE Journal on Selected Areas in Communications, Oct. 1996, Vol. 14, No. 8  |                |
|                                 |                       | HALPER ET AL., Digital-to-Analog Conversion by Pulse-Count Modulation Methods, IEEE Transactions on Instrumentation and Measurement, Aug. 1996, Vol. 45, No. 4  |                |
|                                 |                       | ORTEGA ET AL., Analog to Digital and Digital to Analog Conversion Based on Stochastic Logic, IEEE 0-7803-3026-9/95, 1995  |                |
|                                 |                       | FRANKEL ET AL., High-performance photonic analogue digital converter, Electronic Letters, Dec. 4, 1997, Vol. 33, No. 25   |                |
| /SA/                            |                       | LIN ET AL., Digital Filters for High Performance Audio Delta-sigma Analog-to-digital and Digital-to-analog Conversions, Proceedings of ICSP, Crystal Semiconductor Corporation, 1996, Austin, TX, US  |                |

|                    |           |                 |            |
|--------------------|-----------|-----------------|------------|
| Examiner Signature | /Sam Ahn/ | Date Considered | 03/15/2007 |
|--------------------|-----------|-----------------|------------|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|  |    |                          |               |                        |           |
|--|----|--------------------------|---------------|------------------------|-----------|
| Substitute for form 1449B/PTO<br><br><b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br>(Use as many sheets as necessary) |    | <b>Complete if Known</b> |               |                        |           |
|  |    | Application Number       | 10/686,828    |                        |           |
|  |    | Filing Date              | Oct. 15, 2003 |                        |           |
|  |    | First Named Inventor     | Eric S. Olson |                        |           |
|  |    | Art Unit                 |               |                        |           |
|  |    | Examiner Name            |               |                        |           |
| Sheet  | 12 | of                       | 12            | Attorney Docket Number | TCOM-0010 |

| NON PATENT LITERATURE DOCUMENTS |                       |   |                |
|---------------------------------|-----------------------|---|----------------|
| Examiner Initials*              | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
| /SA/                            |                       | THOMAS, Thesis for the Doctor of Philosophy Degree, UMI Dissertation Services, Jun. 1996, Ann Arbor, MI, US   |                |
| /SA/                            |                       | SCHLEGEL ET AL., Projection Receiver: A New Efficient Multi-User Detector, IEEE, 1995, 0-7803-2509-5/95   | 12             |
| /SA/                            |                       | BEHRENS, Subspace Signal Processing in Structured Noise, UMI Dissertation Services, Jun. 1990, Ann Arbor, MI, US  |                |
|                                 |                       |   |                |
|                                 |                       |   |                |
|                                 |                       |   |                |
|                                 |                       |   |                |
|                                 |                       |   |                |
|                                 |                       |   |                |
|                                 |                       |   |                |
|                                 |                       |   |                |
|                                 |                       |   |                |
|                                 |                       |   |                |
|                                 |                       |   |                |

|                    |           |                 |            |
|--------------------|-----------|-----------------|------------|
| Examiner Signature | /Sam Ahn/ | Date Considered | 03/15/2007 |
|--------------------|-----------|-----------------|------------|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.